1: Bowen C-4 (1945-1947) 1951 ... Maritime Arabs MK2

THE PEARL FISHERIES OF THE PERSIAN GULF

Richard LeBaron Bowen, Jr.

229

THE MOST COLORFUL and widely publicized marine activity of the Persian Gulf is pearl fishing. Since time immemorial the Persian Gulf has been noted for its pearl beds, and Bahrein Island has always been famous for the best pearls. Virtually every ancient and early geographer or traveler writing about the Persian Gulf mentioned pearls and Bahrein Island. An ancient cuneiform tablet found at Ur of the Chaldees, and dated about 2000 B.C., refers to "a parcel of fish-eyes" from Dilmun; some scholars have interpreted this to mean pearls from Bahrein Island. Pliny, writing in the first century A.D., states that Tylos (the classical name for Bahrein Island) "is famous for the vast number of its pearls." *The Periplus of the Erythraean Sea,* written by a Greek sailor about 60 A.D., mentions the Persian Gulf, "where there are many pearl fisheries." An Arab writing in 1050 A.D. states that "pearl fishing is carried on in the sea of Bahrein." In 1583 Ralph Fitch, an English merchant, visited the then famous island of Hormuz in the Persian Gulf and stated that there were "great stores of pearls which came from the Isle of Baharim, and are the best pearls of all others." Such a continuous record of fame is certainly extraordinary. If the "parcel of fish-eyes" sent to the Babylonians was actually pearls, it recorded the start of a continuous 4,000 years of testimony as to the quality of the Persian Gulf product.

000

The factors governing the value of a pearl are multitudinous

114

◆ RICHARD LEBARON BOWEN, JR. is a professional chemical engineer with an intense interest in the Arabian Peninsula. He worked for the Arabian American Oil Company from 1945 to 1947 in Saudi Arabia. In the winter of 1950, he was Technical and Engineering Adviser to the American Foundation for the Study of Man Arabian Expedition, which conducted archeological excavations in South Arabia. Dr. Bowen has already published two books on his scientific researches in Saudi Arabia: *Arab Dhows of Eastern Arabia,* and *The Arabian Necropolis of Ain Jowen.* He has additional articles on dhows and Persian gulf marine industries appearing this year.

L. Bowen C-s (1945-1947) 1951 MK2 Maritime Arabs MK2

and set by arbitrary standards. A first grade pearl should have a perfect "skin," i.e., be free from flaws and specks, and should have a fine "orient," that is, a delicate texture of translucent pink or cream color with an irridescent luster. It is difficult to say whether the size, shape, or color of a pearl is the more important. Other qualities being equal, a perfectly symmetrical pearl is more desirable than a pear-shaped or a flat one. There are pearls of all colors —white, black, gray, green, yellow, gold, and pink. The size of the pearl is important only in combination with a desirable color and shape. Luster is probably the most important characteristic of a first-class pearl; other qualities can be more or less lacking if the pearl has good luster or depth. The most perfect pearl in existence is said to be one in the Zosima Museum in Moscow, known as "La Pellegrina," weighing 28 carats. The largest known pearl is an irregularly shaped one in the Victoria and Albert Museum, having a circumference of 4.5 inches.

The value of a really rare pearl increases by leaps and bounds from purchaser to purchaser. A single example is a Persian Gulf pearl purchased by Barbara Hutton for $75,000; the pearl originally sold for $30,000. It is not necessarily on the spot where the pearl is produced that it is most cheaply procured, and if procured, of the finest quality. Arabs in the Persian Gulf know that the Best Gulf pearls may be purchased most cheaply in India. Peddlers may be found in most towns on the Persian Gulf with necklaces of Gulf pearls for sale; however, these have usually been imported from Bombay.

VALUE OF PERSIAN GULF PEARLS

The annual value of the Persian Gulf pearl fisheries is difficult to estimate exactly, as there are no published figures and the season's crop is not shipped out through any single port. Figures published by some authors are actually only the value of the pearls passing through Bahrein Island. However, as close to 90 percent of the Gulf pearls do pass through Bahrein, these figures give a rough estimate. The earliest figure known dates back to the early 19th century; Wilson stated in 1833 that the value of the pearls produced at Bahrein amounted to from £200,000 to £240,000, while the value of the whole fisheries was about

1: Bowen C-4 (1945-1947) 1951 MK2 Maritime Arabs MK2

£300,000.[1] Wellsted stated that in 1835 the total value was £400,000.[2] Zwemer stated that the value of pearls shipped from Bahrein in 1896 was £303,941.[3]

Cox gives the value of pearls exported in 1925 as £220,000 from Bahrein and £9,000 from Lingeh in Iran, and for 1926 as £192,000 from Bahrein, £11,000 from Kuwait, and £5,200 from Lingeh (a total of about £208,000 for 1926); Cox further states that the true value was probably ten times these figures, for reasons he fails to clarify.[4] However, Thornburg has accepted this last statement of Cox's as a fact and has arrived at a figure of $10 million for the value of the Bahrein fisheries in 1926,[5] a figure that is unreasonably high. Thornburg estimates that in the years immediately following World War II the value of the Bahrein pearl fisheries was about $250,000; Kruegar states that in 1949 the value of the Bahrein pearl fisheries amounted to $200,000.[6] Rihani gives figures for the whole Gulf which amount to about $15 million,[7] the most absurd value published.

A summary of the more reliable figures would seem to be as follows:

1830's	$1,500,000
1835	2,000,000
1896	1,500,000
1925	1,200,000
1926	1,000,000
1946	250,000
1949	200,000

As can be seen from the above table, the value of the fisheries dropped to only a fraction of its previous value after the world depression of the thirties. It should also be pointed out that due to world inflation the figure of $200,000 for 1949 represents less than $100,000 on 1926 monetary standards. However, while the depression dealt the Gulf pearl fisheries a devastating blow, its

[1] D. Wilson, "Memorandum Respecting the Pearl Fisheries in the Persian Gulf," *Geographical Journal*, III (1883), p. 284.

[2] James R. Wellsted, *Travels in Arabia* (London, 1838), p. 264.

[3] Samuel M. Zwemer, *Cradle of Islam* (New York, 1900), p. 100.

[4] Percy Z. Cox, "Persian Gulf," *Encyclopedia Britannica* (Chicago, 1946), vol. 17, p. 603.

[5] Max Thornburg, "Bahrein," *Encyclopedia Americana* (New York, 1949), vol. 3, p. 432.

[6] H. C. Kruegar, "Bahrein," *Collier's Encyclopedia*, II (New York, 1949), p. 668.

[7] Ameen Rihani, *Around the Coasts of Arabia* (London, 1930), p. 275.

1: Bowen C-4 (1945-1947) 1951 MK2 Maritime Arabs MK2

228 continued decline cannot be laid at its door. Japanese cultured
439 pearls first started to appear on the market in quantities in the
435 twenties just before the depression. As time has gone on the competition they offered has tended to become less and less, but on the other hand, the world demand for this gem has reached an all-time low, mainly because of the effect of the cultured pearl.

228 The introduction of cultured pearls and artificial pearls alike
435 has had far-reaching effects on the natural pearl market. While they do not compete insofar as price is concerned when they are recognized as cultured, it takes an expert to distinguish them. Thus, the net effect of cultured pearls, and even more so of the expertly fabricated synthetic pearls, has been to cheapen the pearl as a precious gem in the eyes of those who wear them. There are actually some women who prefer cultured pearls, which are usually more uniform. As a result, natural Gulf pearls do not bring a tenth of what they did a quarter of a century ago at Bahrein.[8]

228 It is a strange fact that even though a cultured pearl is worth only a few percent of the value of real pearls, there are few pearl merchants in the Persian Gulf who can tell a good cultured pearl from the Gulf pearl without destroying the two in the effort.[8] Radiography (x-ray), x-ray diffraction, fluorescence under x-ray radiation, or specific gravity determinations, alone or in various combinations, may be used to detect cultured pearls, but these physical tests are not used by the Arabs for obvious reasons.

228 One might ask why cultured pearls have not been "introduced"
654 into the Persian Gulf pearl market by divers, captains, or merchants. The Arab will tell you that this is improbable. The importation of cultured pearls into the Persian Gulf is prohibited, and in fact carries a severe penalty. The oysters are opened in sight of the divers, so they all know how many exceptional pearls the *nakhoda* (captain) receives and thus what exceptional pearls

[8] One of the world's leading authorities on the differentiation of cultured and natural pearls by their physical properties, Dr. A. E. Alexander, visited the Persian Gulf in 1947 to study the pearl fisheries and took with him a number of fine cultured pearls which he showed to a group of about thirty Bahrein pearl dealers. These Arabs had never seen a cultured pearl, whose importation is normally prohibited, and were astounded at its quality.

1: Bowen C-4 (1945-1947) 1951 MK2 Maritime Arabs MK2

the owner in turn receives. Such fraud as the introduction of cultured pearls, if detected, would bring out the headman's ax, for Arab laws are severe in this respect. But as there are always people willing to make a dishonest dollar or rupee—and the Arabs are certainly no exception—it is inconceivable that cultured pearls, carefully chosen for their similarity to Gulf pearls, have not at times been smuggled into the Persian Gulf. If the Arab merchants cannot detect them, there are probably few experts who could without the aid of delicate and elaborate electrical instruments.

OYSTERS AND OYSTER BEDS

Arab lore in the Gulf relates that the young shell-less oysters come to the surface when it is raining, or when the moon is full. The raindrop is the father of a good pearl and the oyster the mother, while the moon produces luster. A poor season is attributed by many to a shortage of rain. Al-Qazwini, author of *The Wonders of Creation,* gives a different version: the north wind carries a mist containing a viscid substance similar to mercury from the Caspian Sea to the Gulf; the oysters draw in this substance, a large drop forming a large pearl.[9] But every Arab has his own explanation of the phenomenon, and believes that the true scientific explanation is just fantasy.

According to O'Shea, three types of pearl oysters are found in the Persian Gulf, known to the Arabs as *mahharah, zanniyah,* and *sadaifiyah.* The *mahharah* are the commonest, growing to two or three inches in diameter, and producing 98 percent of the pearls found in the Gulf. The *sadaifiyah* is a rare find and seldom yields pearls; it grows to great size (six to eight inches in diameter) and is often collected for its mother-of-pearl. The *zanniyah* is found in the vicinity of the Ras al-Khaymah in Oman; no details of this oyster are given. In the Red Sea two varieties are commonly found: the large oyster, known as the *balbil,* and the small, known as the *sadaf.* The pearl itself is known as *lulu* to the Arabs in the Persian Gulf, irrespective of the species of oyster from which it comes, while the Persians know it as

[9] A. Rihani, *op. cit.,* p. 277.

1: Bowen C-4 (1945-1947) 1951 MK2 Maritime Arabs MK2

228 *mawarid*. O'Shea relates that in Oman the pearl is commonly referred to as *qumash*, which is also Arabic for "material" or "goods." [10]

228 133 Pearl-bearing oysters are found in most of the Persian Gulf waters in depths varying from just below low tide to 20 fathoms. On the Persian side of the Gulf the bottom falls off rapidly to the 50-fathom maximum in the Gulf. On the Arabian side the bottom slopes off gently so that there are extensive areas within the 20-fathom limit. Thus, there are few pearl oysters on the Persian side, although fine pearls have been reported from near Kharaq Island off Bushire, and from Lingeh, but these are exceptions. However, extensive pearl beds are found along the Arabian side, stretching almost continuously for 700 miles from near Ras al-Khaymah east of Sharjah on the Trucial coast, to Ras al-Misha'ab south of Kuwait, the best beds being between 5 and 10 fathoms. The most productive are located to the north and east of Bahrein Island; this is probably why Bahrein has been the pearl center of the Persian Gulf. However, Dr. A. E. Alexander, a leading authority on pearls who visited the banks in 1947, estimates that only 35 percent of the Gulf pearls come from around Bahrein Island; the remainder comes from the Trucial Coast and from the banks near Kuwait.

228 502 825 The success of any pearling season seems to be as unpredictable as the habits of the pearl oysters themselves; the oyster beds shift periodically so that their exact location is not known until the diving starts. Sometimes the pearls are plentiful and valuable, at other times they are neither. Sometimes a bank is sterile for several seasons; then the next it may yield all the highest quality pearls. None of the banks are charted; each *nakhoda* has his own knowledge of them and his own theories. Arab experts believe that the largest, most dense, and whitest pearls come from deep water, while shallow water yields only low density pearls tinted with some color. Some of the more pessimistic Arab observers claim that the Persian Gulf fisheries never yield over two first-quality necklaces in any one season.

[10] Raymond O'Shea, *Sand Kings of Oman* (London, 1947), p. 133.

L: Bowen C-4 (1945-1947) 1951 MK2 Maritime Arabs MK2

THE PEARLING FLEETS

The bulk of the main pearling fleets sticks together, the Kuwait fleet moving down the coast while the Bahrein fleet moves up. The pearlers of the Trucial Coast follow the banks from Ras al-Khaymah to Qatar, a straight-line distance of over 400 miles. The Oman pearlers never go above Halyl Island; they work various areas around the islands in small fleets of 10 to 20 boats, the smaller vessels usually working the grounds nearest their home ports. A pearler assumes a position on the edge of a bank so that by paying out anchor line it will drift across the bank. When the divers begin to bring up only a few oysters, the boat is allowed to drift to a new position. After it has worked completely across the banks, the crew moves it back with the sweeps, to chants and drum beating. It is here that the true skill of the *nakhoda* comes into play — to keep his ship over virgin beds. When day ends the large ships stay on the beds and the crew settles down for the night; the smaller ships usually make for a protected anchorage.

Estimating the number of dhows and men employed in the Persian Gulf pearl fisheries is similar to estimating the population of the Arabian Peninsula. The published figures are largely based on Arab guesswork; most of them are probably much too high. Registers of a sort are kept in every town and port along the coast sending boats to the fisheries, so that figures do actually exist. But these are not published, and an accurate count would necessitate a survey of the whole long Gulf littoral.

In one of the earliest European references to pearling in the Persian Gulf, Niebuhr states that in 1763 the inhabitants of Kuwait lived by the fishery of pearls and fishes, and were said to employ more than 800 boats in these tasks.[11] Over half a century later, Wilson estimated that the pearl fishing boats on Bahrein amounted to about 1,500.[12] In a short account of pearling on the Trucial coast, Whitelock states that in the 1840's there were said to be something over 3,000 boats in the Gulf fisheries.[13] Whitelock adds that the smallest boats had 5 men and the

[11] Carsten Niebuhr, *Travels Through Arabia* (Edinburgh, 1792), p. 127.
[12] D. Wilson, *op. cit.*, p. 285.
[13] H. H. Whitelock, "An Account of the Arabs of the Pirate Coast," *Trans. Bombay Geographical Soc.* I (1844), pp. 42, 45.

L. Bowen C-4 (1945-1947) 1951 MK2 Maritime Arabs MK2

228 464 largest about 18; but as the smaller boats were the more numerous, he used 9 as an average to arrive at a total of 29,000 men employed in the pearl fisheries.

Zwemer estimated the number of pearling boats out of Bahrein in 1896 as about 900, those out of Qatar as 200, and total number of boats as 5,000, employing 30,000 men.[14] However, the figure of 900 does not seem to justify the total of 5,000; since Zwemer lived on Bahrein Island the figure of 900 would seem to be the more accurate. Zwemer is apparently responsible for the figure of 5,000 dhows in the pearl fisheries which has appeared in print so frequently since: Villiers and Simpich state that there were 5,000 boats at the turn of the century, employing 80,000 men,[15] while O'Shea states that in normal times there are about 5,000 boats employing 74,000 men.[16]

Evaluating these estimates and others not mentioned, one is led to the conclusion that there were never over 3,000 boats engaged in the Persian Gulf pearl fisheries, and probably not over 40,000 men. Taking the figures that may be considered as relatively reliable, we arrive at the following average for the fleet during the boom years:

Bahrein (Zwemer)	900
Kuwait	600
Qatar (Zwemer)	200
Eastern Arabian ports	200
Trucial coast (Whitelock)	700
Persian ports (Whitelock)	100
	2,700

This figure would seem to be a fair estimate for the size of the pearling fleet at the turn of the century, and if anything is on the high side

228 464 178 The first few decades of the present century were the last prosperous years that the Gulf pearl fisheries saw. Whereas, at the turn of the century there were almost 3,000 boats engaged in the fisheries, today there are hardly one-fifth that number. An

[14] S. M. Zwemer, *op. cit.*, pp. 100–101.
[15] Alan Villiers, *Sons of Sinbad* (New York, 1940), p. 373; Frederick Simpich, "Rise of the New Arab Nation," *National Geographic Magazine*, vol. 36 (1919), p. 388.
[16] R. O'Shea, *op. cit.*, p. 132.

1: Bowen C-4 (1945-1947) 1951 MK2 Maritime Arabs MK2

estimate of the number of boats operating in 1946 would be as follows:

Bahrein	150
Kuwait	100
Darin, Qatif, Jubail	30
Trucial coast, Qatar, and Persian ports	250
	530

Manning these 500-odd craft were probably not over 10,000 men.

In Oman a strange balance of labor has been set up by the coincidence of the pearling season with the date harvest. Starting about June there is a migration of men northward from the Batinah Coast to the Trucial Coast; these men work the pearl fisheries. Some go north in caravans, others sail up in their *bedens* and other dhows. Opposed to the flood of men who make this temporary migration is a counter-migration of women who move southward from the Trucial Coast to the Batinah Coast; these women are hastening to the date groves for the date harvest. Often the women journey southward on the caravans which are returning from carrying the men to the Trucial Coast. Several months later, in September, the journeyers start the return home.

Bertram Thomas states that a considerable percentage of the army of men annually migrating northward to the Trucial Coast is composed of slaves.[17] These Batinah contingents are usually accompanied by a tribal agent who enlists them with some pearling *nakhoda*. The slaves are the best divers, as they have been at it from youth; freemen usually work the ropes in Oman. Slave divers are noted for their lack of fear of diving into deep water or into muddy water containing weeds. So great is the need for labor in the Trucial pearleries that boats sail into the Gulf from as far away as Socotra to join the pearl fishing.[18]

Pearl fishing is a seasonal occupation, as the divers must wait for warm summer water before starting to dive. Probably few people realize there is a winter in the Persian Gulf, and that the water gets so cold that swimming for periods of over five minutes is extremely chilling. In Hasa Province it is not uncommon

[17] Bertram Thomas, *Alarms and Excursions in Arabia* (London, 1931), p. 238.

[18] Ibid., p. 143

1: Bowen C-4 (1945-1947) 1951 MK2 Maritime Arabs MK2

228 464 132 for the minimum winter air temperature to be in the middle forties; during this period the sea water temperature in shallow water will be in the low sixties.

228 147 464 132 Pearl diving requires that the diver's body be almost continually in the water. From experience the Arabs have found that the surface water temperature has to be about 85° F. before continued deep-water diving is feasible; thus the main pearling season (*al-ghaws al-kabir*, or "great diving") averages four months—from June into the first week of October. During this time the maximum surface water temperature exceeds 90° F. (in August) off Hasa. O'Shea states that on the Trucial Coast *al-ghaws al-kabir* often lasts until late October, the water apparently remaining warmer longer there than further north."[19] In addition to *al-ghaws al-kabir*, there are two other seasons: the "cold diving" season (*al-ghaws al-barid*) running from April to May, and the *mujannah*, running from October to March. The smaller boats run out in the shallower (warmer) waters for *al-ghaws al-barid* and act as a barometer for the season, while the *mujannah* is worked by waders who work along the shore when the tide is out, many equipped with glass-bottom "look boxes."

527 228 For *al-ghaws al-kabir* the various fleets, whether from Kuwait, Bahrein, or the Trucial Coast, leave port en masse with flags flying, to the beating of drums and Arab chants. The few boats from the smaller ports slip out without fanfare. It is a stirring sight to see these fleets of dhows maneuver with their sweeps and then set forth under huge spreads of lateen sails, with their freshly oiled, burnt-brown hulls glistening across the aquamarine water, like some ancient Phoenician or Roman fleet.

228 502 An admiral represents the pearl fishing fleet of each port. It is the admiral's boat which leaves the port first, and the admiral's duty to determine when the water becomes too cold for continuous diving. It is considered improper (by the owners) for the *nakhoda* of any large vessel to leave the pearl banks before the admiral leaves."[20]

[19] R. O'Shea, *op. cit.*, p. 137.

[20] The admiral of al-Khobar, Saudi Arabia, now works for the Arabian American Oil Company, for al-Khobar no longer sends vessels out to the pearl grounds.

1: Bowen C-4 (1945-1947) 1951 MK2 Maritime Arabs MK2

DIVING TECHNIQUE

The rights to the Persian Gulf pearl fisheries are jealously guarded by the Arabs, and these rights have been backed up by the British Government for over a hundred years. They are limited to the inhabitants of the Gulf littoral—Arabs and Iranians. Pearl diving in the Persian Gulf is carried on without the use of any professional diving gear; it is "skin diving." The British have prohibited drags, dredges, and compressed air diving suits or helmets, and there is a 30,000 rupee ($9,000) fine for violation of the law.

However, in spite of this protection, foreigners have dived for pearls in the Gulf, and diving equipment has been used. In 1882 a Bombay syndicate sent a steamer, the *Johnstone Castle,* without official permission to the Bahrein banks. After five days the vessel was arrested by a British gunboat; its yield had been only 23 seed pearls.[21] During the pearling season of 1935 some Italians employed by the Qusaibi Brothers, wealthy merchants of Hofuf, Saudi Arabia, used deep-sea diving suits.[22] Presumably these merchants figured themselves exempt from British proclamations, inasmuch as they were Arabian nationals. But nothing more was ever heard of the venture, so it was either not a financial success or else the British brought pressure to bear against the practice. The Arab customs officials of both Saudi Arabia and Bahrein Island have been extremely suspicious of oil company divers, who spend a lot of time under water inspecting pipelines and piers, and they used to watch them through field glasses to see that they never brought up any oysters.

The maximum depth at which the divers work is about 12 fathoms.[23] Sweeps are left projecting overboard athwartships and are lashed to the tholepins and the deck. The divers' lines pass over the sweeps so that they will not become fouled. To get to the bottom a diver puts his foot in a loop of rope tied to a stone or iron weight, releases a slip knot holding the rope to the sweep, and holding onto the rope plummets down. The attendant pulls up the stone as soon as he feels it hit bottom. The diver holds onto

[21] R. O'Shea, *op. cit.*, pp. 140–41.
[22] K. S. Twitchell, *Saudi Arabia* (Princeton, N. J., 1947), p. 26.
[23] A. Villiers, *op. cit.*, p. 374; Hugh Smith, "The Pearl Fisheries of Ceylon," *National Geographic Magazine,* 33 (1912), p. 174; R. O'Shea, *op. cit.*, p. 137.

[285] The diver holds onto another line to which is tied an open-weave palm leaf basket for 228 the oysters; sometimes the diver has the oyster basket tied to his waist or around his neck and has the line tied to his body. When the diver is ready to come up, he gives several tugs on the rope. Thus the diver does not have to waste his valuable energy in swimming up or down. When he first reaches the bottom, he attempts to go out perpendicularly from the boat, frantically plucking all the oysters he can see before his air gives out. The diver usually crawls on one hand and one foot, using the other foot to propel himself and his free hand to collect the oysters.

228 The divers wear a horn noseclip similar to a clothespin; this 292 keeps the water out of their noses and enables them to hold their breath longer. Sometimes a diver will stuff cotton or beeswax into his ears to keep the water out. A set of leather finger thimbles protects his fingers from coral and other sharp objects; he wears only a loin cloth. This is the equipment universally used in the Persian Gulf, whether the diver is out of Kuwait, Bahrein, the Trucial Coast, or Persia. These divers wear no goggles and many [164] have impaired vision from trachoma, so their efficiency is cut down considerably. It is strange that the Arabs have not added at least eye socket goggles, which the South Sea Island and Philippine pearl divers have eagerly accepted.

228 Alan Villiers states that the Kuwait pearl divers make ten 461 consecutive dives and then rest while a "substitute" makes ten; these two divers have the same attendant.[24] Divers in other parts of the Gulf work continuously, taking a rest all together at certain predetermined times, sometimes corresponding with prayer-time.

The diver stays under about a minute, then rests for two or three.[25] Ten dives would consume about three-quarters of an

[24] A. Villiers, *op. cit.*, p. 392.

[25] The average length of time that a diver stays under water has long been a controversial question. Alan Villiers (*op. cit.*, p. 392), who spent two months with the Kuwait pearling fleet, states that the divers averaged about a minute, ranging from 40 to 90 seconds. O'Shea (*op. cit.*, p. 137), spending some time among the Trucial coast pearlers, states that divers there remain under water from 40 to 75 seconds, also averaging about one minute. Whitelock (*op. cit.*, p. 43), who visited the Trucial coast pearl fisheries one hundred years ago, stated that the divers averaged about 40 seconds under water, but that he never saw them remain over a minute. Hugh Smith (*op. cit.*, p. 185) states that in the Ceylon fisheries the Arabs are the best divers, staying down from 60 to 75 seconds, with a normal maximum of 90 seconds, and that there is an authentic case of an Arab staying under 109 seconds in seven fathoms of water. In any

1: Bowen C-4 (1945-1947) 1951 MK2 Maritime Arabs MK2

hour, after which time the Kuwait diver is dragged out of the water and huddles in some spot on the ship looking more dead than alive. He may average four shifts a day, making a total of 40 dives; O'Shea states that under excellent conditions the Trucial divers average 50 dives a day.[20] During this time he has spent almost one hour under water. Ten dives are not difficult, nor are 50 excessive in one day for anyone experienced; but day after day and week after week the diving goes on — for four months. When the season is over, the diver has weathered the impossible; he has probably completed over 3,000 dives in from 30 to 50 feet of water, and has spent over 50 hours under the surface of the Persian Gulf — that is, over a full forty-hour week without air, valiantly striving to gather all the oysters he can see through his blood-shot and irritated eyes, which become less sensitive with each dive.

Every ten days or so the divers do get a day of rest, and if the *shamal* is blowing they have to wait it out, as it roils the water. Occasionally they have to go ashore to bury a diver who fails to complete his 3,000 dives. It is not surprising that there are one or two empty stations on each boat; their occupants lie huddled corpse-like under their cloaks in some part of the ship, too sick from scurvy or plain fatigue to dive. After they have been at it for many weeks, the divers are apt to get convulsive shivers when they come out of the water for their rest, even though the temperature may be 110° F. and their tenders are covered with a lather of sweat. There are few, if any, white men who could endure just one day of such punishment; the Arab could not either except for his belief that Allah is merciful and that a Paradise awaits him.

Every dhow has to put in for water and food every three weeks or so. In recent years the pearling fleet has used the oil company's pier at Ras Tanura for water, but vessels have been known to replenish their water supply from some of the submarine springs which gush into the Persian Gulf. A diver goes down with an empty skin and opens it in the potable stream; he can bring up fairly fresh water by this means. One of these submarine springs,

case stories one hears about the amazing power of the Arabs to stay under water from 5 to 10 minutes or more are absurd.

[20] R. O'Shea, *op. cit.*, p. 137.

1: Bowen C-4 (1946-1947) 1951 MK2 Maritime Arabs MK2

located a few miles north of Jubail, has been marked by a spar buoy by order of King Ibn Saud.

O'Shea states that while the divers on the Trucial Coast are rarely attacked by sharks, about 30 were attacked and two killed around 1940.[27] Whitelock states that the Arabs claimed that the danger of sharks was ever present, but that their worst fear was from the saw fish, which had been known to cut divers completely in two.[28]

Rihani writes that what the Persian Gulf pearl diver dreads most is the *dawl*. However, he apparently does not realize what the *dawl* is, merely quoting Sheikh Khalifah ibn Muhammad al-Nabhani's *History of Bahrein:* "The *dawl* is a semi-fluid animal, about the size of a man's hand, round in shape, with a multitude of tendons about two feet in length, resembling a network of silk. It has no power of locomotion, but is driven by the waves and currents hither and thither. If it comes in contact with the body of man, it burns it, leaving a deep scar; and if it is lifted out of the water and left in the sun for five minutes, it dissolves."[29]

The zoologist will immediately recognize this description of the *dawl* as a jellyfish. It is in fact a small bell-shaped jellyfish with two to three foot-long tentacles. The *dawl* swims at any level and is practically invisible underwater; thus the divers cannot keep away from the stinging tentacles, which will burn the body and can put out an eye. Along the Ras Tanura peninsula, the *dawl* is most often seen near the surface shortly before flood tides.

There is a species of needle urchin (*Diadema*) in the Persian Gulf with spines from one or two feet long.[30] It is known that these spines will produce nasty slow-healing wounds if bumped into under water. This urchin may be the cause of some of the open sores on the divers' legs, although salt water alone could cause them, for the Persian Gulf has the highest salt content of all the ocean bodies, and constant immersion in salt water is known to produce a rash. However, as the *Diadema* is black and several

[27] *Ibid.*, p. 238.
[28] H. H. Whitelock, *op. cit.*, p. 43.
[29] A. Rihani, *op. cit.*, p. 280.
[30] *Diadema* was first reported from the Persian Gulf by this author: A. H. Clark and R. LeB. Bowen, Jr., "Echinoderms of Saudi Arabia," *American Museum Novitates*, No. 1390 (1949).

1: Bowen C-4 (1945-1947) 1951 MK2 Maritime Arabs MK2

feet in diameter, it is easily seen under water, and thus more easily avoided than the *dawl*. The Arabs have no fear of the sea turtle and they relate that when they find one of these on the pearl banks, they ride it to the surface by grabbing it behind the neck and directing it upward.

But the dangers from sharks and devilfish (rays) are slight compared to the physical danger resulting from simply driving oneself past the limit of human endurance. The "bends" are a common affliction among the divers and may cause severe pains in the joints, paralysis, or even death. Suppuration of the eardrums and rheumatism are also common. The divers may lose blood from surfacing too quickly or from staying under too long; Frederick Simpich tells of seeing a man come up from a 10-fathom dive bleeding at the nose as if someone had hit him with a ball bat.[21] Whitelock states that the divers of the Trucial Coast were very emaciated and suffered from inflamed eyes, which they treated with antimony.[22]

Divers never eat while working, except for a sip of tea or water, as food would cause nausea. When the sun has sunk so low that diving stops, they eat a few dates or a little rice and drink a little tea, but that is all. This is one of the reasons why they become so weakened and emaciated during a season. Sleep is the only energy builder the divers have.

OPENING THE OYSTERS

With dawn the first activity of the day is the opening of the oysters caught the day before. By this time the oysters have been out of the water long enough for their shells to open, so that one does not have to fight them. The oysters are not divided according to divers, but are simply piled in sacks on the deck, so that no one knows exactly who caught the one that may contain the great pearl. After the valves are parted, the openers knead through the flesh, extract any pearls, and throw the shells and the meat overboard. Less than one-third of the oysters yield pearls and these are mostly "seed pearls," those very small irregularly-shaped pearls which might well be called "pearl dust."

[21] F. Simpich, *National Geographic Magazine*, vol. 36 (1919), pp. 369–93.
[22] H. H. Whitelock, *op. cit.*, pp. 38, 44.

1: Bowen C-4 (1945-1947) 1951 MK2 Maritime Arabs MK2

228 The captain watches the whole procedure closely to see that no pearls are secreted; when the last oyster is opened, he collects all the pearls, ties them in a small red cotton flannel cloth, and puts them in his sea chest on the poop deck.

The Persian Gulf procedure for opening the oysters is in vivid contrast to the practice of some of the other pearl fisheries. In Ceylon, for example, all the oysters for any one day are brought into the yards of the company holding the concession to the banks. Each diver carries his own oysters up to the stockaded compound where he divides them into three piles. The company inspector comes around and tells the diver which pile he can take; when he leaves the compound he has to give back a portion to his attendant and to the captain of the boat.

There is evidence that some such practice may have been carried out along the Arabian coast in the past. A century ago the pearlers of the Trucial Coast opened their oysters on land, for Whitelock relates that the pearlers remained at sea until they had a boatload of oysters and then proceeded to the nearest island to open the shells.[22]

228 172 During medieval times the Arabians on the mainland controlled Bahrein Island; their capital was at Hofuf. Huge heaps of oyster shells, some a hundred yards long, stretch along the shore a mile south of al-Khobar. Nearby have been found grinding pestles, stone diving weights, and crude pottery fragments. The species of oyster in these mounds is the same small variety commonly found today. When the refinery at Ras Tanura was being built, a low hill was leveled by bulldozers. Cutting through many ancient graves they turned up a stone diving weight among the numerous bones and pottery. Between Jubail and Ras Tanura, several more ancient shell heaps have been located high on the beach. Some of these are composed *entirely* of the large plate-sized species of pearl oysters; now this species is found only occasionally.

MARKETING AND DIVISION OF PROFITS

228 437 The majority of pearls are sold to Bombay merchants, but frequently brokers in search of a bargain will buy the best before

[22] *Ibid.*, p. 42.

the dhows leave the banks. These men wander through the fleet in their own boats (usually launches) always trying to get to a first quality pearl before the other brokers hear of it, and always hoping that the *nakhoda* will not recognize its value. The broker's paraphenalia consists of a magnifying glass, a small hand balance, weights, and a set of brass screens for grading the pearls. When pearls are sold on the banks they are ceremoniously transferred from the captain's red bunting to the broker's.

Regardless of where they are sold, the majority of the pearls go to Bombay, and from Bombay eventually to Paris, the world's pearl emporium. Pearls are usually shipped to Bombay by air. The reason is simple: Usury and insurance are prohibited by the Quran. If the pearls were shipped to India by Arab dhow or steamer through an Arab agent, there could be no insurance on the consignment. However, if the pearls are shipped via Trans World Airline or British Overseas Airlines Corporation, the pearls can be heavily insured. Thus, the Arabs use a Western agency to get around the Quranic prohibition. In Bombay, Indian workers skillfully pierce the pearls with fine bow-driven drills and string them on silk, graded according to color and size. The pearls are sold to European dealers in bunches consisting of a number of strings and generally known as "Bombay bunches."

When the season has ended and the pearls are sold, the captain deducts the cost of the food and provisions. What is left represents the profit. Of this the owner of the dhow gets one-half; of the remainder each diver and each attendant gets one share and the captain two. Most of the dhows leaving Saudi Arabian ports are small (not over 40 feet) with small crews—usually something like 6 divers, 4 attendants, and a captain. Thus, each diver and attendant would get one twenty-fourth (about 4 percent) of the profits, and the captain would get one twelfth (about 8 percent). The pearling dhows operating out of Bahrein and Kuwait are generally much larger than the Saudi Arabian dhows, and may have crews of 40 or more. The profits of these craft are split in much the same way as the profits on smaller dhows, but the captain gets more shares with these larger crews than he does with the smaller.

1: Bowen C-4 (1946-1947) 1951 MK2 Maritime Arabs MK2

ECONOMIC RELATIONSHIPS

228 426 Pearling is a great gamble for everyone concerned. A share may be worth only 50 or 100 rupees if the take has been poor, but on the average a share should net at least several hundred rupees. It must be remembered that a share usually represents a year's earning, since the pearling industry operates on the "debt system." This is not to be confused with the "truck system," for the workers in the Persian Gulf pearl fisheries are not paid in produce. In the debt system the divers and tenders get actual cash advances during the seasons they are out of work, and their families get food and supplies while they dive. They must pay off their incurred debts with their earnings after the pearling season, but somehow they never seem able to get free.

228 426 672 Until recently, a diver who accepted cash advances from a *nakhoda* had doomed himself to diving until death, and unfortunately death might not be an exit, as his debt was simply passed on to his son or brother, who then went on to incur his own debt. Once in debt a diver is prohibited from hiring to another *nakhoda*—he must repay his debt to the man who gave him cash advances. A diver or anyone else who accepts an advance in the pearling industry has sold himself to economic slavery, for the *nakhoda* owns his ability to work, while the man must support himself. Thus, a diver is bound to return to the purgatory of pearling at the *nakhoda's* call. Since Muslim law prohibits interest or usury the debt system effectively gets around this. The *nakhoda* is usually in turn bound to some merchant in the same way, for he has taken cash advances to give to his divers and attendants.

567 465 In Oman the *nakhodas* often hire their labor from a tribal agent, giving the agent an advance of money and rice. In the case of slaves, the agent takes this to the slaves' master; at the end of the season he collects the balance of the slaves' earnings. Thus the slaves' earnings go completely to his master, who in return clothes and feeds him.

228 656 426 On Bahrein Island the Bahrein Government has, at the suggestion of the British, effected many reforms in the pearling industry with respect to the debt system. Hereditary debts have been abolished; pearl divers on Bahrein now take their debts to

their graves, and justly, too, for diving probably hastened their end. The Government demands that account books be given each diver and that they be kept up properly, and sends inspectors to see that they are. Before the season begins at Bahrein the amount of cash advances is agreed upon and proclaimed. The divers have put up a terrific objection to this limitation, for it seemed to them that they were simply getting less money. They could not understand that their debt was being lowered—in fact they did not care, for hadn't they always been in debt?

There is a "diving court" which enforces the arbitrary laws of the industry, such as those dealing with engagement of labor, taxes, spurious pearls, etc. The court also disposes of any case of a *nakhoda* who cannot pay off his debts; the *nakhoda* may lose his boat and divers, but not his personal property.

There has never been any noticeable effort on the part of the ruling sheikhs to better the lot of their subjects: if they were unemployed for long periods in the winter they would be sure to work harder during the pearling season to pay off their winter's debts. As the local sheikhs levy a tax on every boat and get a cut of some sort on the proceeds, the pearlers in a sense work for them. The sheikh thus always looked on the lack of other employment with favor, for if a man were happily employed as a farmer, fisherman, or herder there would be little incentive to enter the pearling purgatory. Under normal conditions the divers have an eight months' loaf during which time they live off their *nakhoda;* this is to the liking of both the diver and the *nakhoda.*

However, many divers do find other work, as fishermen or mariners. The depression of the thirties hit the Persian Gulf pearl industry with great suddenness. Within a short period tens of thousands of pearlers in the Gulf found themselves without an occupation. The marine stock of Kuwait rose to the situation and gradually shifted to cargo hauling between Kuwait and Basra, Iran, India, South Arabia, and East Africa. Large ocean-going double-ended dhows have carried the fame of Kuwait seamanship throughout the Middle East, sailing to Africa on one monsoon and back on another. Kuwait oil operations have been drawing on this labor supply as well, so that nowadays the

2: Bowen C-4 (1945-1947) 1951 MK2 Maritime Arabs MK2

464 maritime *nakhodas* are having difficulty in getting crews. Many of their sailors, who also operated under the debt system, are now working for oil interests.

464 315 On Bahrein oil began to be developed as early as 1932, just when the pearl industry started its real slide. Oil come late for Saudi Arabia, and it was not until 1945 that the industry absorbed large numbers of native laborers. By then the town populations were so well adjusted that most of the labor came from the desert Bedouins. These jobs with the oil companies at first absorbed the unemployed, but as the oil projects developed they have absorbed more than the unemployed, until now the *nakhodas* of Bahrein, Kuwait, and Saudi Arabia are having an increasingly hard time finding divers; the divers are working for the oil companies and paying off their debts.

The Trucial Coast has yet to have the oil boom wash its shores. Today many men still make the northern trek from the Batinah coast, and the *nakhodas* there have little difficulty in finding pearling crews. But the happiest Arabs in the Gulf are the 556 sheikhs in the oil areas, for even though their revenue from pearls is at an all-time low, they now get their cut from oil, a much more lucrative and reliable commodity.

[For bibliographical references, see complete text.]